# Red Hat CloudForms 3.1 Management Engine 5.3 OpenShift Enterprise Deployment Guide

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Instructions for deploying OpenShift Enterprise with CloudForms Management Engine

CloudForms Documentation Team

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## Abstract

This guide provides information on deploying OpenShift Enterprise using CloudForms Management Engine.

# Table of Contents

**1. Preparing CloudForms Management Engine for OpenShift Enterprise Deployment ..... 2**
1.1. The oo-install-ose Tool 2
1.2. CloudForms Management Engine Categories and Tags 2

**2. Preparing a Virtual Machine for OpenShift Enterprise ..... 2**

**3. Creating Virtual Machine Service Items ..... 3**

**4. Creating an OpenShift Enterprise Deployment Service ..... 5**

**5. Deploying an OpenShift Enterprise Service ..... 7**

**A. Revision History ..... 12**

# 1. Preparing CloudForms Management Engine for OpenShift Enterprise Deployment

## 1.1. The oo-install-ose Tool

Installation of OpenShift Enterprise requires CloudForms Management Engine 5.3.2 or greater, and the oo-install-ose tool. The oo-install-ose tool is a technology preview feature.

Download the oo-install-ose tool here: BZ#1181872 oo-installer

oo-install-ose documentation is available here: https://install.openshift.com

Red Hat recommends locating the oo-install-ose tool in the **/root/** directory of the CloudForms Management Engine appliance, although this can be changed. Ensure that execution permission is enabled for the oo-install-ose files, and place the files on all appliances that have the Automation role enabled in your environment.

## 1.2. CloudForms Management Engine Categories and Tags

To facilitate the deployment of OpenShift Enterprise, create the **OSE Policy** and **OSE Status** tag categories if they do not already exist on your system.

1. Navigate to **Automate** → **Simulation**.
2. In the **Object Details** field, select **Request** in the **/System/Process/** list.
3. Enter **create** in the **Message** field.
4. Enter **osetags** in the **Request** field.
5. In the **Object Attribute** field, select **None** in the **Type** list.
6. In the **Simulation Parameters** field, select **Execute Methods**.
7. Click **Submit**.

The **OSE Policy** and **OSE Status** categories and tags are automatically created. The **automation.log** file displays creation progress.

# 2. Preparing a Virtual Machine for OpenShift Enterprise

To host OpenShift Enterprise, virtual machines require the following:

- Red Hat Enterprise Linux 6.4 or higher
- Network access, with valid IP addresses and access to the OpenShift Enterprise sources, for example through Red Hat Subscription Manager or Red Hat Satellite
- SSH key access from all appliances running the Automation Role to the virtual machines
- Ruby 1.9.3 or higher

Red Hat recommends creating a virtual machine template meeting these requirements to enable efficient deployment of multiple instances. You can use your preferred source, for example PXE, ISO, or Clone, when creating the virtual machine so long as the requirements are met for OpenShift Enterprise installation.

**Procedure 1. Preparing a Template Virtual Machine**

1. Install Red Hat Enterprise Linux 6.4 from ISO as a basic server on a new virtual machine using Red Hat Enterprise Virtualization.
2. Register the virtual machine with Red Hat Subscription Manager and update the system using **`yum update`**.
3. Install Ruby 1.9.3 using **`yum install`**.
4. Copy the SSH key from your appliance to the virtual machine. Confirm you can open an SSH session from the appliance to the virtual machine.
5. Prepare the virtual machine to become a template by clearing the UDEV rules for Network and unique details from the **`ifcfg-eth0`** file.
6. Power off the virtual machine and use the Red Hat Virtualization console to create a template from the virtual machine.

DNS is an important element of the environment, as machines must be able to connect bi-directionally to any resource in the network using the hostname. That means that new virtual machines instantiated from the template need to register to your DNS system automatically.

## 3. Creating Virtual Machine Service Items

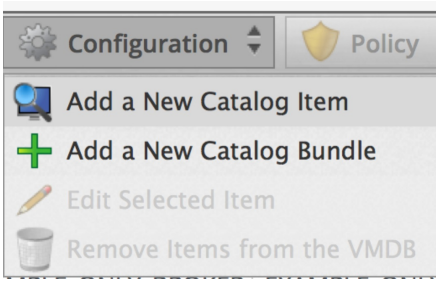
The number of virtual machine service items required corresponds to the number of servers you want to deploy in your OpenShift Enterprise service bundle. For example:

- A single OpenShift Enterprise All-In-One bundle requires ONE virtual machine service item.
- A broker and node located on separate servers requires TWO virtual machine service items.
- A four node and one broker bundle requires FIVE virtual machine service items.

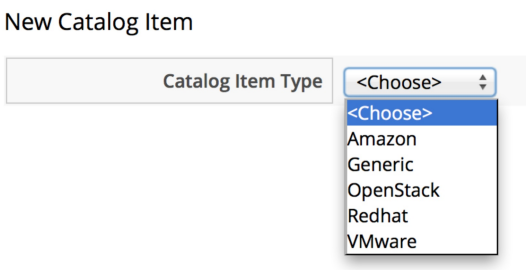
Virtual machine service items are represented individually but can be configured identically. If desired, you can separate brokers from nodes on different hosts by adjusting those settings when creating the service items.

**Procedure 2. To Create Service Items**

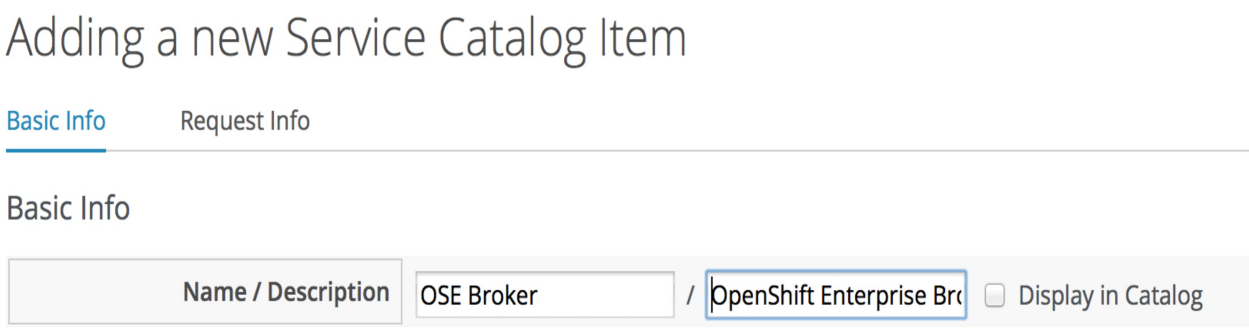
1. Log in to the CloudForms Management Engine appliance and navigate to **Services → Catalogs**.
2. Select the **`Catalog Items`** accordion.
3. Click **Configuration → Add a New Catalog Item** to create a new service item.




4. Select a destination platform from the **`Catalog Item Type`** list.




5. Enter a name and description for the service item. Red Hat recommends using the OpenShift Enterprise role as the name. For example, if the service item is a broker, then call it **`OpenShift Enterprise Broker`**.



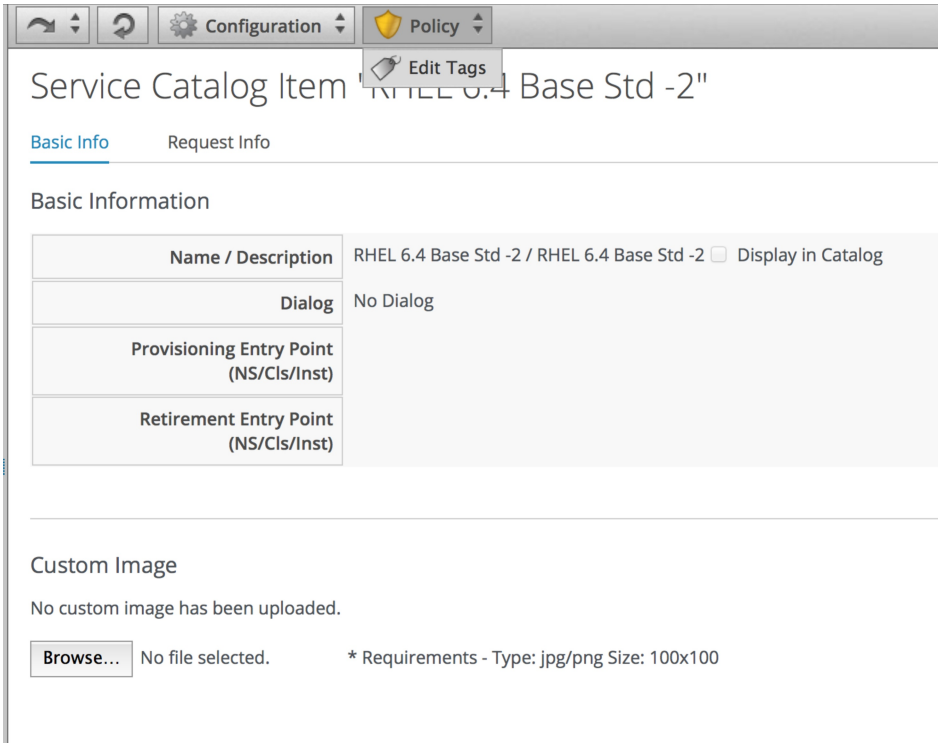

6. Select the **`Request Info`** tab and set the virtual machine options.

    a. Select a virtual machine as a base template that conforms to the minimum requirements for OpenShift Enterprise.

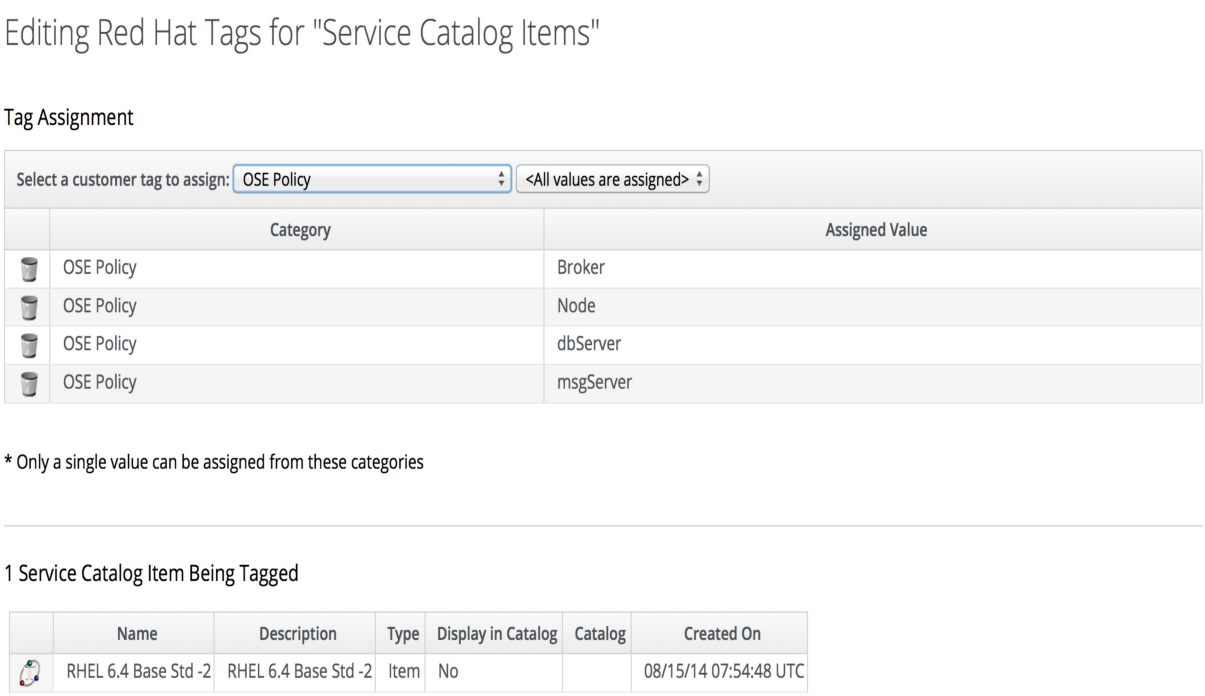
    b. Enter a name for the virtual machine. CloudForms Management Engine assigns numbers automatically to ensure no conflicts. Red Hat recommends using a name similar to the service item name, for example **`OSE-BROKER`**.

    c. Set the virtual machine to **`start/power on`**.

7. After creating the service items, tag them with their role. This enables CloudForms Management Engine to install the correct role on the service item at the time of deployment. Click **`Policy`** → **`Edit Tags`**.




8. Within the policy settings for the service item, assign the required **`OpenShift Enterprise Policy`** tags.
   - For a broker, assign the **`Broker OSE Policy`**.
   - For a node, assign the **`Node OSE Policy`**.
   - For an All-In-One OpenShift Enterprise server, assign all the **`OSE Policy`** tags to the service item: **`Broker`**, **`Node`**, **`msgServer`**, and **`dbServer`**.

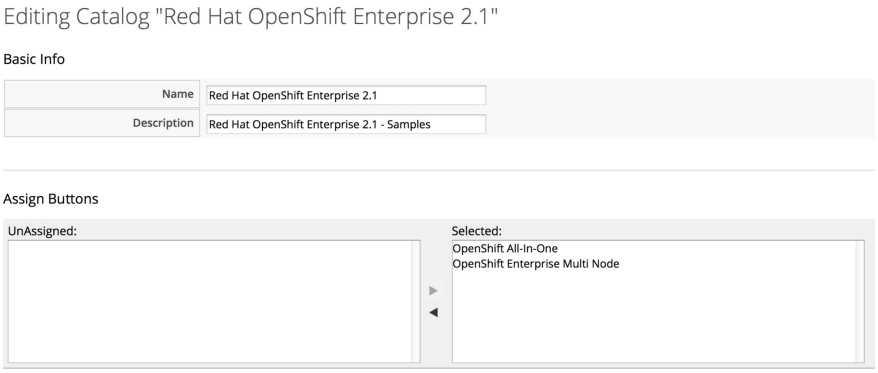



## 4. Creating an OpenShift Enterprise Deployment Service

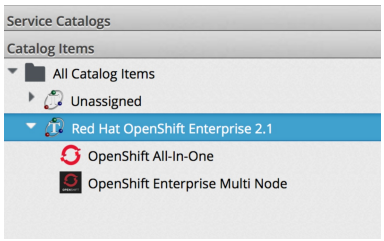
Service items do not exist as OpenShift Enterprise nodes, brokers, or servers, as they have not been

ordered and instantiated yet by a consumer. In order for consumers to request these items and provide them with deployment options, the items must be collected in a service bundle. CloudForms Management Engine presents this bundle to the user, and it can include other items in addition to OpenShift Enterprise. The following procedure combines the service items created earlier to create a bundle.

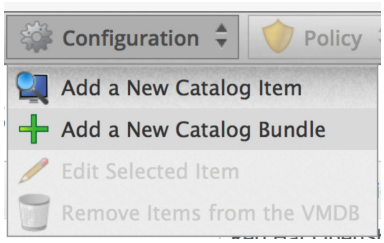
1. Log in to the CloudForms Management Engine appliance and navigate to **Services → Catalogs**.
2. Select the **Catalogs** accordion.
3. Click **Configuration → Add a New Catalog**.



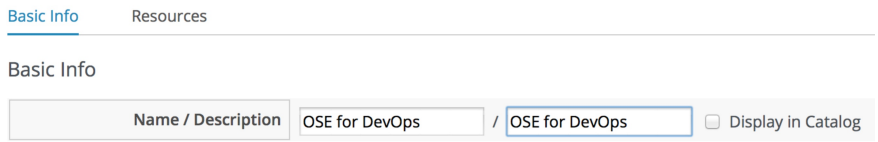

4. Select the **Catalog Items** accordion and select the new catalog.




5. Click **Configuration → Add a New Catalog Bundle**.



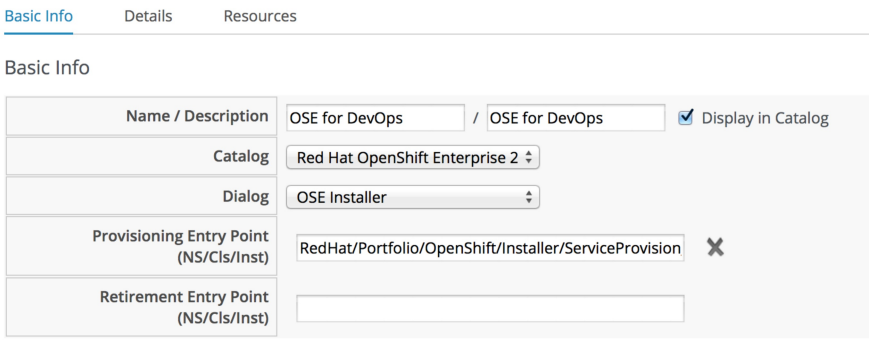

6. Enter a name and description for the bundle.




7. Select **Display in Catalog**.
    a. Select your new catalog from the **Catalog** list.
    b. Select **OpenShift Enterprise Installer** from the **Dialog** list.

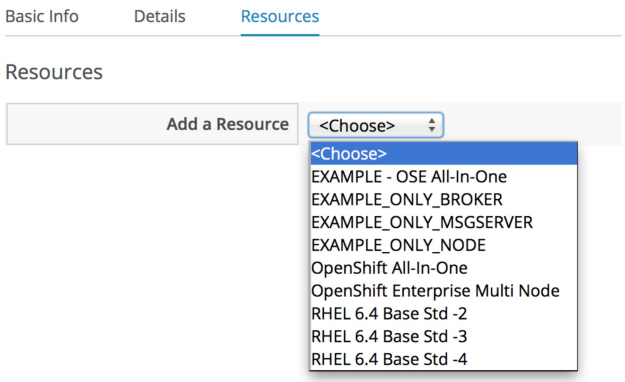
c. Set the **Provisioning Entry Point** to **/RedHat/Portfolio/OpenShift/Installer/ServiceProvision_Template/oseINSTALLER**.

d. Leave **Retirement Entry Point** blank.

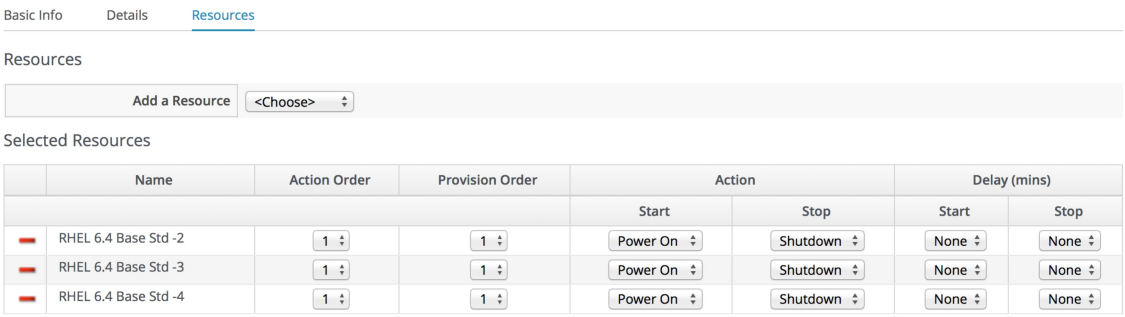



8. Select the **Details** tab. If desired, use HTML to enter details for the consumer to view in the catalog.

9. Select the **Resources** tab. Use the **Add a Resource** list to add the required service items.




When you add a service item, it appears in **Selected Resources**.



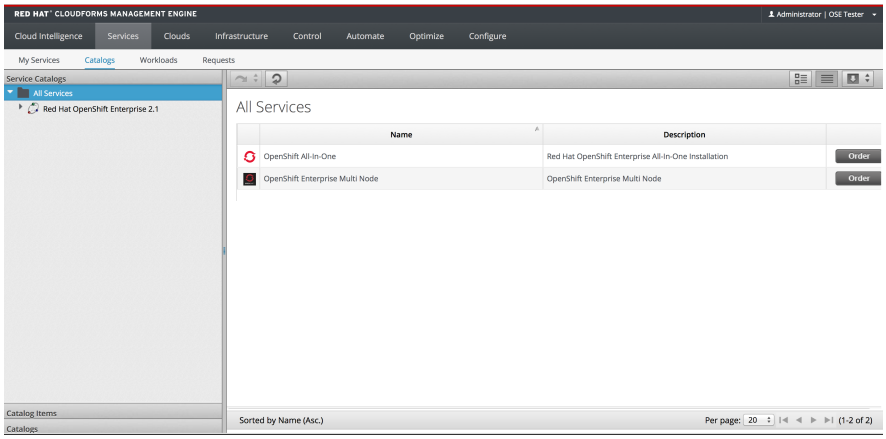

10. Click **Add**.

CloudForms Management Engine creates the bundle and makes it available to consumers in their service catalog. Tag the service as required to control its visibility to different roles.

## 5. Deploying an OpenShift Enterprise Service

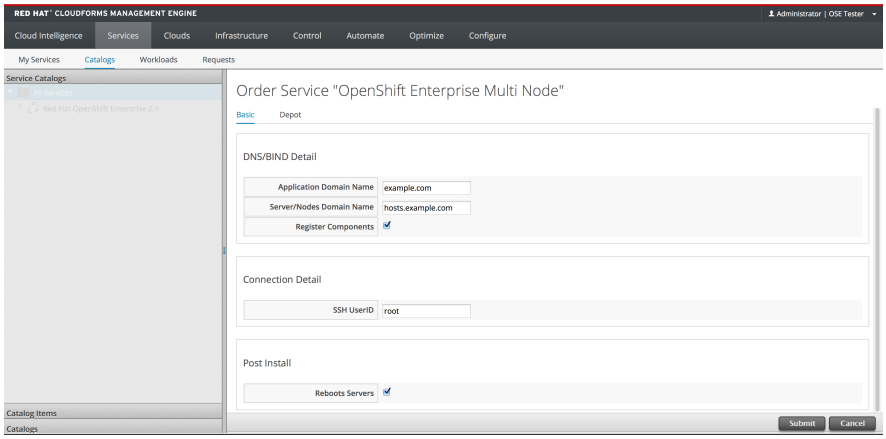
Deploy an OpenShift Enterprise service by requesting the catalog item.

1. Log in to the CloudForms Management Engine appliance and navigate to **Services → Catalogs**.




2. Select the catalog item. This example uses **`OpenShift Enterprise Multi Node`**. Click **`Order`**.

3. Enter the basic details for the service as required.




4. Select the **`Depot`** tab to configure the depot type.

**`None`**

A local repository as configured in the destination virtual machine's **`.repo`** files.

**`RHSM/RHN`**

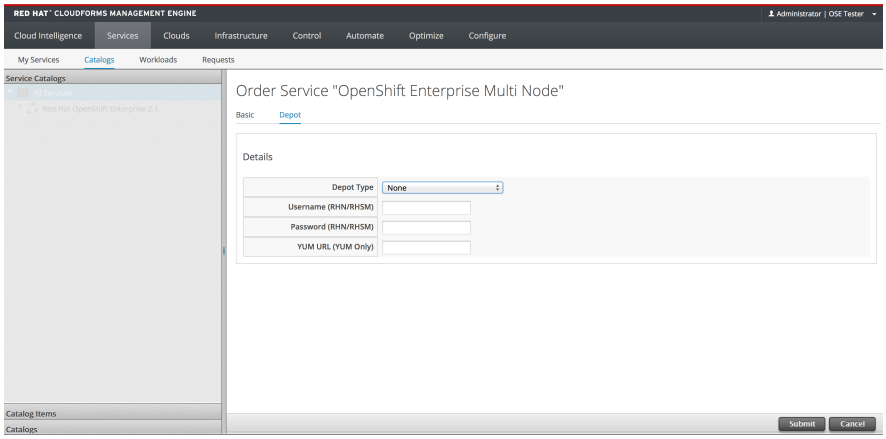
Use either Red Hat Subscription Manager or Red Hat Network. Requires an internet connection.

- Username: Enter your RHSM or RHN Username.
- Password: Enter your RHSM or RHN Password.

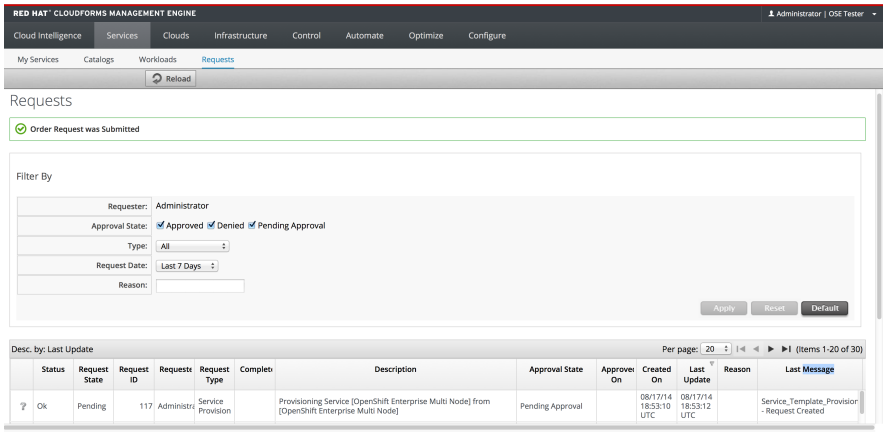
**`YUM`**

Manually provide a URL to the YUM repository.

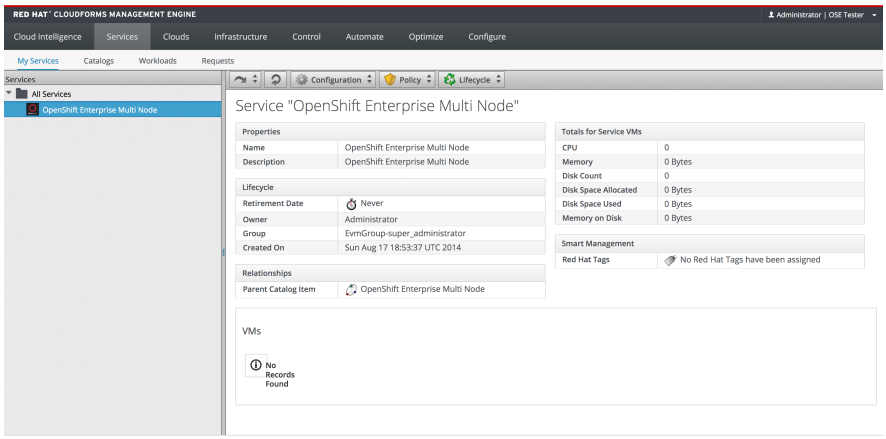
- YUM URL: A URL for a YUM repository containing all the required packages for an OpenShift Enterprise install.




5. Click **`Submit`** to order the service and add it to the queue.




6. Navigate to **Services → My Services** to view the ordered service.




Note that the **`VMs`** field initially displays **`No Records Found`** as the service is currently being instantiated.

## Notes

### Service Names

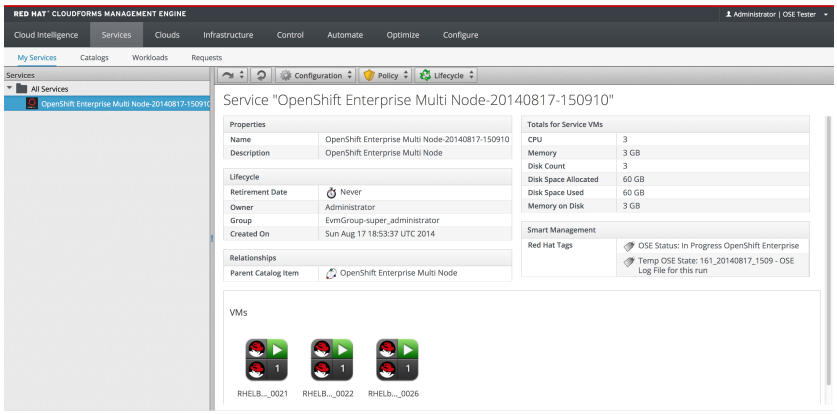
Initially, the service name is the same as the bundle. During the installation of OpenShift Enterprise the service is renamed to include the date and time to ensure it is unique in the **`My Services`** screen.

### Smart Management

The **`Smart Management`** area displays important information about the deployment of OpenShift Enterprise services.

- The install process creates tags dynamically and assigns them to various items. The tags serve two purposes:
  - provide debugging information if a failure occurs in the OpenShift Enterprise installation process.
  - enable the installer to track the progress of various items during the installation process.

  In the following example, there are three virtual machines present and the **Smart Management** area displays the **In Progress** and **Temp OpenShift Enterprise State** tags.



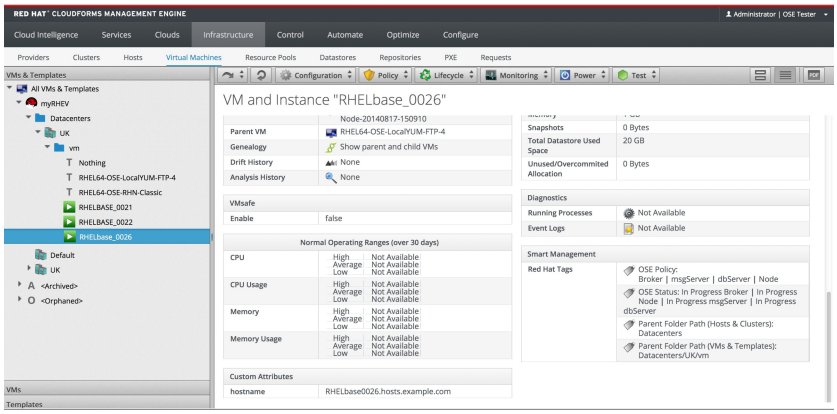

- The **Temp OpenShift Enterprise State** tag displays the name of the **oo-install-ose** log file for this run. As each service deployment generates a new log file, this tag enables you to associate each deployment to its log file. To view the log file for a deployment:
  - Record the unique ID for the deployment's log file found in the **Temp OpenShift Entperprise State** tag. For example:

    ```
    Temp OpenShift Enterprise State : 161_20140817_1509 –
    OpenShift Enterprise Log File for this run
    ```

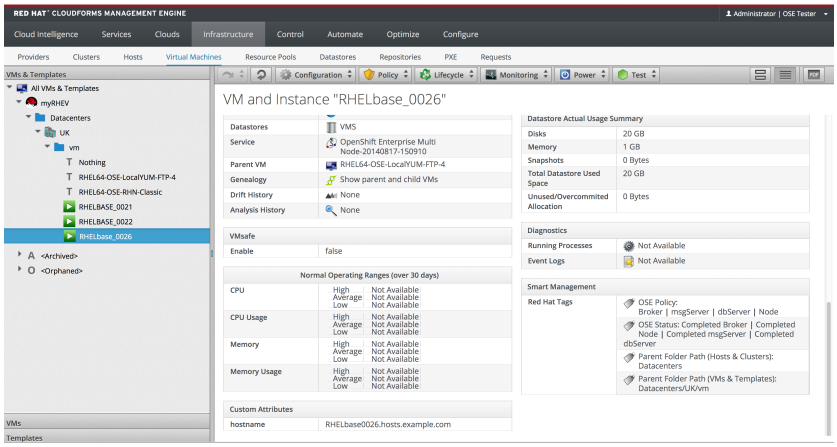
  - Access the automation appliance performing the deployment and change to the **/tmp/** directory.
  - Deployment log filenames consist of the unique ID suffixed by **_ose.log**. For example:
    - **161_20140817_1509_ose.log**

  By default, log files record all the actions the **oo-install-ose** installer performs. They also contain information on retrieving logs from remote installations. All other CloudForms Management Engine activities are logged to the automation log as normal.

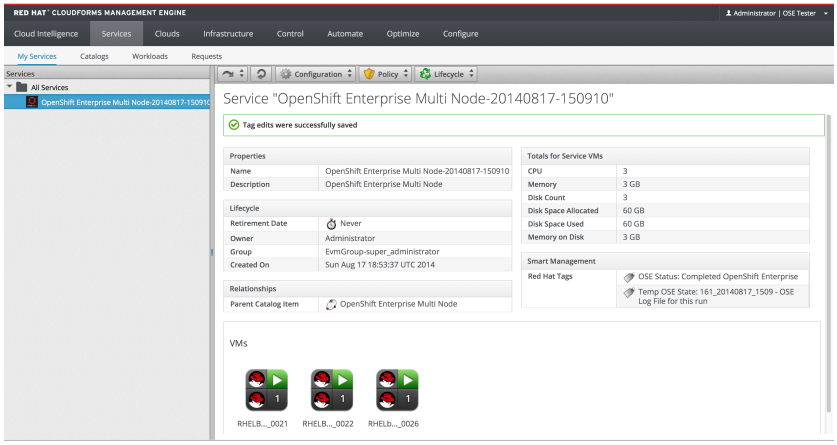
- CloudForms Management Engine also tags individual virtual machines in the service. The following example displays a virtual machine in a service during its deployment of OpenShift Enterprise. The **Smart Management** area includes two important pieces of information:
  - OpenShift Enterprise Policy: the roles designated for this virtual machine
  - OpenShift Enterprise Status: the roles that the virtual machine is currently installing




- After the virtual machine completes role installation, the **`OpenShift Enterprise Status`** tag updates to **`Completed`** for the roles assigned in the **`OpenShift Enterprise Policy`** section.




- When the OpenShift Enterprise install finishes, the service is tagged **`Completed`**.



# A. Revision History

| | | |
|---|---|---|
| **Revision 1.3-0** | **Tue Feb 3 2015** | **CloudForms Docs Team** |

Update product name to Red Hat CloudForms

| | | |
|---|---|---|
| **Revision 1.2-0** | **Wed Jan 14 2015** | **CloudForms Docs Team** |

Updated the link for the installer file.

| | | |
|---|---|---|
| **Revision 1.1-0** | **Mon Nov 17 2014** | **CloudForms Docs Team** |

Final packages for CloudForms 3.1.1

| | | |
|---|---|---|
| **Revision 1.0-0** | **Wed Nov 12 2014** | **CloudForms Docs Team** |

Initial book creation.